ASSIGNMENT 2

Textbook Assignment: "Construction of an Internal Combustion Engine," chapter 3, pages 3-1 through 3-48.

2-1. Gasoline and diesel engines are alike in what respect?

1. Both belong to the same engine family
2. Both have the same basic internal components
3. Both have the same number of cylinders
4. Their internal parts are interchangeable

2-2. What is the function of the stationary parts of an engine?

1. Add power to the engine
2. Keep the engine firmly attached to its supporting base
3. Furnish a framework on which to attach or enclose moveable parts
4. Regulate crankshaft speed

2-3. Which of the following parts provides a basic frame for the liquid-cooled engine used in automotive and construction equipment?

1. Engine base
2. Cylinder head
3. Cylinder block
4. Crankcase

2-4. Aluminum cylinder blocks are cheaper to produce than cast iron cylinder blocks.

1. True
2. False

2-5. An engine block with newly bored cylinders may not vary in diameter by more than

1. 0.0005 in.
2. 0.0050 in.
3. 0.0500 in.
4. 0.5000 in.

2-6. The cylinders of an air-cooled engine are separate from the crankcase and made of what material?

1. Cast iron
2. Nickel
3. Molybdenum
4. Forged steel

2-7. The purpose of the fins surrounding the cylinders of an air-cooled engine is to provide

1. means for strengthening the cylinder walls
2. a large surface area for heat dissipation
3. mounting plates for the cylinder head
4. a uniform diameter the entire length of the cylinder

2-8. What is the function of the cylinder liners in an engine?

1. To prevent scoring and cracking of the engine block
2. To increase cylinder wear limitations
3. To reduce the frequency of engine overhauls
4. To provide a wearing surface other than the engine block

2-9. What is the purpose of the interconnecting passages in the cylinder head and block?

1. To allow access for the removal of casting material
2. To provide a path for the coolant to circulate
3. To prevent cracks in the casting as they cool
4. To provide a path for the lubrication oil to circulate

2-10. What part of the air-cooled engine provides the mounting surface for the cylinders and oil pump?

1. Crankcase
2. Cylinder block
3. Cylinder head
4. Core hole

2-11. On an air-cooled engine, the cylinder heads are made of aluminum to resist corrosion.

1. True
2. False

2-12. The stationary part of an internal combustion engine that carries waste gases of combustion from the cylinders is called the

1. intake manifold
2. exhaust manifold
3. carburetor
4. water pump

2-13. The intake manifold of a gasoline engine is designed to provide the fuel with a short and direct path between the carburetor or fuel injection system and the cylinder. This design reduces the possibility of the air-fuel mixture condensing in the intake manifold.

1. True
2. F a l s e

2-14. What valve controls the amount of exhaust diverted into the intake manifold heat passage in an exhaust-heated intake manifold?

1. Manifold heat control
2. Exhaust control
3. Butterfly
4. Bimetal control

2-15. A gasket is placed between the cylinder head and engine block to

1. prevent gas and water leaks
2. provide even heat distribution
3. maintain clearance between the cylinder head and engine block
4. prevent excessive temperatures within the cylinder head

2-16. From what material are the gaskets for intake and exhaust manifolds usually constructed?

1. Pressed paper
2. Pressed cork
3. Soft metal
4. Asbestos

2-17. Of what type of material are oil pan gaskets usually made?

1. Oil-resistant paper
2. Pressed cork
3. Soft metal
4. Asbestos

2-18. In modem engines, fluid losses through clearances between moving parts and stationary parts are prevented by the use of

1. plastic strips
2. packing glands
3. leather wicks
4. oil seals

2-19. In an engine, heat energy is changed to mechanical energy by the pressure of combustion acting on the

1. connecting rods
2. camshaft
3. crankshaft
4. pistons

2-20. The downward motion of the piston in the cylinder is converted to rotary motion by the action of the

1. gear tram
2. camshaft
3. connecting rod and crankshaft
4. valves

2-21. What design feature is the principal difference between a diesel engine piston and a gasoline engine piston?

1. Diesel engine pistons weigh less than gasoline pistons
2. Diesel engine pistons are made of cast iron while gasoline engine pistons are made of aluminum
3. Diesel engine pistons are usually fitted with more piston rings than gasoline engine pistons
4. Diesel engine piston use oversized lands and piston pins

2-22. What feature is built into pistons to control expansion?

1. A larger crown
2. A slot is cut up the side of the skirt
3. A bronze brace is cast into them
4. Oversized lands

2-23. What are the two types of piston skirts?

1. Partial trunk and full-skirted
2. Full trunk and semiskirted
3. Semi-trunk and full-skirted
4. Full trunk and partial skirted

2-24. The piston pin (wrist pin) attaches the piston to what component?

1. The crankshaft
2. The camshaft
3. The connecting rod
4. The balance shaft

2-25. In addition to sealing off the combustion chamber and distributing lubricating oil, piston rings serve to

1. transfer heat from the pistons to the cylinder walls
2. absorb the shock of the power stroke
3. prevent heat expansion of the piston
4. provide an air bleed during the intake stroke

2-26. The additional groove cut into a piston just above the top ring groove is known as a

1. piston land
2. heat dam
3. oil control groove
4. ring gap

2-27. The split in the piston ring is necessary for installing the ring on the piston and for expansion from heating. This split is known as a

1. ring gap
2. ring joint
3. heat dam
4. staggering gap

2-28. Piston rings are staggered during assembly to

1. allow even heat dissipation
2. prevent cylinder blow-by
3. cause even cylinder wear
4. allow the use of expanders

2-29. Piston rings are coated with what material to minimize scuffing?

1. Graphite
2. Engine oil
3. Silicone
4. Carbide

2-30. During engine operation, thrust from the piston is transmitted to the crankshaft by what component?

1. The balance shaft
2. The camshaft
3. The connecting rod
4. The flywheel

2-31. What type of bearing is used in the piston end of the connecting rod?

1. Roller
2. Ball
3. Bushing
4. Sleeve

2-32. Precision connecting rod bearings are held in position against the crankshaft by

1. projection on the bearing shells
2. bolts that hold the connecting rods together
3. slip fittings on the connecting rod
4. projections on the connecting rod and cap

2-33. The crankshaft of a military engine is normally constructed of what material?

1. Aluminum
2. Cast steel
3. Forged steel
4. Cast iron

2-34. On an in-line six-cylinder engine, the crankshaft throws are set apart by how many degrees?

1. 180°
2. 120°
3. 90°
4. 60°

2-35. What is the function of the counterweights on a crankshaft?

1. To balance the weight of the connecting rod and piston
2. To transmit power from the crankshaft to the camshaft
3. To reduce shock from the power strokes
4. To provide momentum for crankshaft rotation during the compression stroke

2-36. The purpose of thrust faces found on some main bearings is to

1. prevent crankshaft vibration
2. maintain connecting rod alignment
3. eliminate crankshaft end play
4. ensure proper bearing lubrication

2-37. What type of vibration occurs when the crankshaft twists because of the power stroke?

1. Vibration due to deflection
2. Vibration due to imbalance
3. Torsional vibration
4. Thrust vibration

2-38. What part of an engine is likely to fail when subjected to uncontrolled torsional vibrations?

1. Camshaft
2. Piston
3. Connecting rod
4. Crankshaft

2-39. In addition to reducing engine speed fluctuations, the flywheel often serves as a

1. power takeoff for the camshaft and a pressure surface for the clutch
2. pressure surface for the clutch and starting system gear
3. starting system gear and a power takeoff for the fuel pump
4. power takeoff for the fuel pump and a timing reference for the ignition system

2-40. Which of the following components does not help to make up the valve-actuating mechanism?

1. Camshaft and camshaft followers
2. Pushrods
3. Rocker arms
4. Crankshaft

2-41. What is the function of the camshaft?

1. To hold the valves in place
2. To force gases from the combustion chamber
3. To operate the valve mechanism
4. To rotate the valves

2-42. On what type of engine head is the camshaft usually located directly above the crankshaft?

1. V
2. L
3. I
4. F

2-43. The camshaft of a two-stroke cycle engine will rotate at what speed when the crankshaft speed is 1,000 rpm?

1. 250 rpm
2. 500 rpm
3. 1,000 rpm
4. 2,000 rpm

2-44. The camshaft may have external gears or cams that operate the fuel injectors, lubrication pump, and fuel pump.

1. True
2. False

2-45. What type of mechanical follower (tappet) is used in heavy-duty applications?

1. Roller
2. Mushroom
3. Flathead
4. Adjusting

2-46. How is zero clearance maintained by the hydraulic type tappet shown in figure 3-48 in the text?

1. By vacuum pressure
2. By oil pressure
3. By cam lobe action
4. By spring action

2-47. Poppet-type valves are not designed in which of the following shapes?

1. Mushroom
2. Tulip
3. Semitulip
4. Semimushroom

2-48. Because the exhaust valves of an engine can experience temperatures in excess of 1300°F, the valve IS normally made of what type of alloy?

1. Nickel chromium
2. Nickel sodium
3. Silichrome
4. Silichrome chromium

2-49. In vehicles that use unleaded -fuel. the wear of the valve face and seat IS accelerated. What type of valve is used to decrease wear and prolong the life of the valve?

1. Stellite
2. Mushroom
3. Poppet
4. Sodium-filled

2-50. An accumulation of carbon on valve seats will result in what problem?

1. Increased valve life
2. Cooler operating temperatures
3. Positive valve seating
4. Improper valve closure

2-51. Valve seat inserts used in aluminum engines are made of what material to withstand the extreme heat produced'?

1. Steel
2. Bronze
3. Copper
4. Zinc

2-52. The close clearance between the valve guide and the valve stem is important for which of the following reasons?

1. Allows lubricating oil into the combustion chamber
2. Permits exhaust gases into the crankcase
3. Permits exhaust gases into the combustion chamber
4. Keeps the valve face in alignment with the valve seat

2-53. Valve float is caused by which of the following conditions?

1. Low spring tension
2. Excessive spring tension
3. Weak valve retainer
4. Weak valve rotator

2-54. Valve reconditioning does not include which of the following?

1. Grinding valves and valve seats
2. Adjusting valve tappet clearance
3. Timing the valves
4. Sanding the rings

2-55. What part of the engine must be removed before the valves are accessible'?

1. Cylinder head
2. Exhaust manifold
3. Intake manifold
4. Valve-operating mechanism

2-56. During reassembly of an engine, replacing the valves in their original guides will ensure

1. excessive wear of the valve and guide
2. less wear of the valve and guide
3. failure of the valve to seat properly
4. noisy valve operation

2-57. The difference between valve seat angle and valve face angle is known as interference angle.

1. True
2. False

2-58. One procedure for checking valve guide wear involves the use of what instrument(s)?

1. A thickness gauge only
2. A hole gauge and micrometer
3. A depth gauge and micrometer
4. A valve guide gauge only

2-59. What procedure is used to compensate for valve guide wear?

1. Reaming
2. Boring
3. Knurling
4. Honing

2-60. Once the valve guides are serviced and the valve seats are ground, the concentricity of the two are checked using what measuring instrument?

1. Hole gauge
2. Valve seat dial indicator
3. Micrometer
4. Bore gauge

2-61. When replacing pressed-in valve seats, you should chill the new inserts in dry ice for 15 minutes.

1. True
2. False

2-62. When the valve seat does not touch the valve face properly, the seat must be reground at different angles. This procedure is known as

1. narrowing a valve
2. lapping a valve
3. squaring a valve
4. bluing a valve

2-63. Which of the following checks does not have to be made on valve springs before reassembling them?

1. Squareness
2. Free height
3. Tension
4. Tensile strength

2-64. Which of the following actions is a step in the procedure for installing the directly driven timing gears on an engine?

1. Position the gears so that the single marked tooth of one gear is between the two marked teeth of the other gear
2. Rotate the two gears until their marked teeth can be aligned with a straightedge
3. Install the timing chain after positioning the crankshaft and camshaft gears
4. Match the idler gear teeth with those on the camshaft and crankshaft

2-65. Oil moving across the face of a bearing does not accomplish which of the following functions?

1. Cools the bearing
2. Lubricates the bearing
3. Removes dirt from the bearing
4. Heats the bearing

2-66. The back of the typical bearing half is made of what bearing?

1. Cast iron
2. Bronze
3. Steel
4. Copper

2-67. Which of the following metal alloys is not plated on the back of a typical bearing halt?

1. Babbitt
2. Aluminum
3. Copper
4. Bronze

2-68. What test is the most often used to determine the mechanical condition of an engine?

1. Vacuum gauge
2. Compression
3. Cylinder leakage
4. Computer control

2-69. When a compression test is performed on a gasoline engine, the compression reading from the highest to the lowest cylinder should not vary over 15 to 20 psi.

1. True
2. False

2-70. When a vacuum test is performed above 1,000 feet, the average reading will lose approximately what amount of inches of vacuum per 1,000 feet?

1. 1 in.
2. 2 in.
3. 3 in.
4. 4 in.

2-71. When a vacuum test is being performed, the gauge drops to 15 inches and remains there. This reading indicates the existence of what problem?

1. Improper idling adjustment
2. Compression leak between the cylinder walls and the piston rings
3. Electrodes set to close on the spark plugs
4. Compression leak between the cylinder head and the engine block

2-72. When performing a cylinder leakage test, you must ensure the piston is at what position'?

1. BDC
2. TDC
3. ATDC
4. BBDC

2-73. When a cylinder leakage test is performed, a leaking head gasket is indicated by which of the following conditions?

1. Bubbles in the coolant at the radiator
2. Excessive hissing of air at the oil tiller tube
3. Loud hissing of air at the carburetor
4. Coolant observed coming out the exhaust pipe